OFFICE OF THE UNDER SECRETARY OF DEFENSE
WASHINGTON, DC 20301

ACQUISITION

20 OCT 1993

MEMORANDUM FOR VICE CHIEF OF STAFF OF THE ARMY
VICE CHIEF OF NAVAL OPERATIONS
VICE CHIEF OF STAFF OF THE AIR FORCE
OFFICE OF GENERAL COUNSEL
DIRECTOR, ACQUISITION PROGRAM INTEGRATION
DIRECTOR, TACTICAL SYSTEMS
DIRECTOR, STRATEGIC AND SPACE SYSTEMS

SUBJECT: Request for Coordination on Revised Live Fire Test and Evaluation (LFT&E) Guidelines

Request your coordination on the attached by COB November 12, 1993. Please call Mr. Doug Nation, x57171, for pickup.

Charles E. Adolph
Director
Test and Evaluation

Attachment
Revised LFT&E Guidelines

OFFICE OF THE UNDER SECRETARY OF DEFENSE
WASHINGTON, DC 20301

ACQUISITION

EXECUTIVE SUMMARY

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (ACQUISITION)

FROM: DIRECTOR, TEST AND EVALUATION, OUSD(A)
Prepared by Mr. H. Douglas Nation, DT&E, X57171

SUBJECT: Revision of the Live Fire Test & Evaluation Guidelines

PURPOSE: Provide a memorandum for your signature releasing the revised Live Fire Test & Evaluation Guidelines

DISCUSSION:

- Chapter 139, Title 10 USC contains requirements for vulnerability and lethality testing of covered systems. This requirement was mandated by the FY 1987 Authorization Act.

- A set of Live Fire Test and Evaluation (LFT&E) Guidelines were released on June 1, 1988 to provide guidance to the Services. These were subsequently incorporated into the DoD Directive 5000.1, DoD Instruction 5000.2, and DoD Manual 5000.2M.

- Problems with the 1988 guidelines and some parts of the 5000-series documents have become evident. A National Research Council (NRC) Study released in Fall 1992 recommended revision of the guidelines to alleviate observed difficulties. This has been accomplished.

- The guidelines have been revised in cooperation with the Test & Evaluation Service Principals. We agree that this revision is needed unless or until the legislation is changed.

COORDINATION: Director, API _____ Director, TS _____

OGC _____ Director, SSS _____ DACS-ZD _____

NOP-09 _____ SAF/CV _____

RECOMMENDATION: Sign the attached memorandum releasing the revised guidelines and authorizing updating of DoD 5000

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301-3000

ACQUISITION

MEMORANDUM FOR ACTING SECRETARY OF THE ARMY
SECRETARY OF THE NAVY
SECRETARY OF THE AIR FORCE

SUBJECT: Live Fire Test and Evaluation Guidelines

The attached guidelines implement the Congressionally legislated Live Fire Test and Evaluation program within the Department of Defense. These replace all previous editions of the guidelines. They have been reviewed and recommended by your Vice Chiefs.

To be consistent with the attached guidelines, changes to DoD Directive 5000.2 and supporting documents will be made in the next scheduled update.

Attachment
as stated

LIVE FIRE TEST AND EVALUATION (LFT&E) GUIDELINES

1. PURPOSE: The purpose of these guidelines is to describe a disciplined management approach for the conduct of Live Fire Test and Evaluation (LFT&E), within the Department of Defense (DoD), in compliance with LFT legislation. Chapter 139 of Title 10, United States Code, contains requirements for vulnerability and lethality Live Fire Testing of covered systems, major munitions programs, and product improvements to covered systems and major munitions programs. Appendix A provides copies of relevant sections of these laws. The guidelines describe the objective and scope of LFT&E, provide guidance for LFT&E planning, testing, evaluation and documentation, and discuss the responsibilities of LFT&E principals. Applicable documents are DoD Directive 5000.1, DoD Instruction 5000.2, and DoD Manual 5000.2-M.

2. OBJECTIVE: The objective of LFT&E is to provide a timely and reasonable assessment of the vulnerability/lethality of a system as it progresses through its development and prior to full-rate production. In particular:

- to provide information to decision makers on potential user casualties, vulnerabilities, and lethality, taking into equal consideration susceptibility to attack and combat performance of the system.
- to ensure that knowledge of user casualties and system vulnerabilities or lethality is based on testing of the system under realistic combat conditions.
- to allow any design deficiency identified by the testing and evaluation to be corrected in design before proceeding beyond low-rate initial production.

3. SCOPE: These guidelines apply to the Office of the Secretary of Defense (OSD), the Organization of the Joint Chiefs of Staff, the Unified and Specified Commands, the Military Departments, and all DoD components who have responsibilities associated with the design, development, procurement, or modification of combat materiel items. Heads of DoD components may issue implementing guidance to provide for unique requirements within their respective components.

4. DEFINITIONS: The legislation covering LFT (Appendix A) also provides definitions of "*covered system*," "*major munitions program*," "*covered product improvement programs*," "*realistic survivability testing*," "*realistic lethality testing*," and "*configured for combat*." The following definitions are not given in that legislation but are provided here to permit a better understanding of LFT requirements:

a. *Full-up Test*: A vulnerability test conducted on a complete or partial system loaded or equipped with all dangerous materials (including flammables and explosives) that would normally be on board in combat (configured for combat). All critical subsystems, which could contribute to the test outcome, must be operating (e.g., hydraulic and electrical power) under realistic conditions. For lethality testing, the munitions or missile must be production representative. The target must be representative of the class of systems that includes the threat, and be sufficiently realistic to demonstrate the lethal effects the weapon is designed to produce.

b. *System-Level Test*: A test conducted on the complete system, but may or may not be a Full-up test.

c. *Live Fire Test:* A test within the OSD approved LFT&E strategy that involves the firing of actual munitions at target components, target sub-systems, target sub-assemblies or system-level targets (which may or not be configured for combat) to examine personnel casualty, vulnerability and/or lethality issues.

d. *Full-up, System-Level Test*: A Live Fire Test that is both a Full-up and System-Level test. A LFT&E Strategy will include Full-up, System-level tests.

e. *Survivability*: The capability of a system to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

f. *Vulnerability*: The characteristic of a system which cause it to suffer a definite degradation (loss or reduction of capability to perform its designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man-made) hostile environment. Vulnerability is considered a subset of survivability.

g. *Lethality*: The ability of a munition (or laser, high power microwave, etc.) to cause damage that will cause the loss or a degradation in the ability of a target system to complete its designated mission(s).

h. *Susceptibility*: The degree to which a weapon system is open to effective attack due to one or more inherent weakness (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.). Susceptibility is considered a subset of survivability.

5. IMPLEMENTATION: An active, well-planned, well-managed and well-executed LFT&E strategy is essential to understanding system vulnerability/lethality and will be an essential element of the information supporting decisions regarding the acquisition of materiel as well as the development of doctrine for its proper tactical employment. The LFT&E strategy for a given system should be developed as soon as possible after Milestone I, and be structured and scheduled so that any design changes, resulting from that testing and analysis, as described in the strategy, may be incorporated before proceeding beyond low-rate initial production. LFT&E considerations should be included in all phases of the weapon system acquisition cycle, beginning with concept exploration and continuing until Milestone III. Furthermore, the LFT&E strategy should be managed, including planning and programming, in such a manner that all elements of the test and evaluation (T&E) process are well-integrated and complementary. The availability of facilities, test sites, instrumentation, personnel, threat targets, munitions, and/or directed energy weapons should be managed throughout all phases of the budget cycle.

a. LFT&E should be initiated as early as possible and completed before full-rate production (Milestone III), to identify and assess possible design deficiencies so that appropriate corrective actions can be taken. Beginning with component level testing and analysis during concept demonstration and validation, live fire vulnerability/lethality test and evaluation continues through engineering and manufacturing development (E&MD) with additional components/subsystem testing, and progresses to LFT&E of production representative items before the system proceeds beyond low-rate initial production. The LFT&E strategy should be structured to provide a timely and reasonable examination and understanding of the vulnerability/lethality of US weapon systems and munitions/directed energy weapons to the full spectrum of validated combat threats/targets. Subsequent product improvements to covered systems/major munitions programs meeting the criteria given in Appendix A are also required to undergo Live Fire Testing. The major interpretation of the law that must be made is the "significant" impact to vulnerability or lethality. If any doubt exists, the system should be assumed to be covered and appropriate action taken. This includes waiver action if the testing would be unreasonably expensive or impractical. Legal counsel should be used to verify the final determination of program status. All LFT&E will be conducted by the Services with OSD oversight. Non-Developmental Items (NDI) and Advanced Technology Demonstrators/Prototypes that meet the definition of covered system/ major munitions program may also be required to undergo LFT&E.

b. Live Fire Testing of all systems will be predicated upon the DoD Intelligence Community's official assessment of the principal threat systems and capabilities an adversary might reasonably bring to bear in an attempt to defeat or degrade a specific US system as described in the System Threat Assessment Report (STAR); or equivalent document.

c. Vulnerability and lethality assessments may require the use of validated modeling/simulation and other analytic techniques. Where modeling/simulation and other analytical efforts are essential elements in a LFT&E strategy, pre-shot predictions will be included.

d. The generation of data to resolve critical LFT&E issues in an efficient and cost effective manner to represent realistic environments shall be of paramount concern in the shot-line selection process for live-fire testing. While an element of randomness in shot-line selection is often desirable, total reliance on complete randomness may neither be consistent with the test objectives nor be an efficient use of test resources. Random shotlines are generated from a realistic distribution of hit points, to include such factors as the weapon system operator, target signatures and weapon seeker characteristics. In most cases a mixture of random shotlines (shotlines generated from likely hit points) and engineering shotlines (i.e., shotlines specifically selected by the evaluator to address specific vulnerability/lethality issues) will be appropriate. It is required that some portion of the total shots be randomly drawn from a combat distribution of likely hit points, when known.

e. The evaluation of LFT test results will address kill given a hit (i.e., vulnerability or lethality). However, the outcome of LFT&E will not necessarily be expressed in terms of probabilities. Rather, Live Fire Testing should address vulnerability or lethality primarily by examining basic damage and kill mechanisms and their interactions with the target system. Further, the evaluation of vulnerability test results will address, where possible, the susceptibility of the system.

f. Although LFT&E programs may differ significantly in scope and timing, the level of maturity at various stages of the acquisition process is basically the following: By Milestone I, a decision should be made whether the system meets the legislative criteria for a covered system/major munitions program. Initial draft strategies should identify proposed issues, existing data in support of the issues, and Live Fire Tests to be conducted throughout the acquisition process. By Milestone II, the TEMP should contain a mature strategy. In particular, the strategy must either commit to Full-up, System-Level, Live Fire Testing, or a waiver request and alternative LFT&E plan must have been submitted for approval according to DoD Manual 5000.2-M, Part 11, "Live Fire Test and Evaluation Waiver." The entire LFT&E program, to include testing, evaluation, and reporting, must be completed by Milestone III.

6. RESPONSIBILITIES: The responsibilities of the DoD Staff and the Services relative to LFT&E are outlined below:

a. **OSD**: The Director, Test and Evaluation (D,T&E):

(1) Serves as the OSD focal point for review, coordination, and approval of LFT&E policy.

(2) Approves LFT&E strategies, as provided in the Test and Evaluation Master Plan (TEMP), IAW DoDI 5000.2 and DoD Manual 5000.2-M.

(3) Approves candidate systems for LFT&E. Annually reviews all potential systems for inclusion or exclusion from the LFT&E oversight list according to DoDI 5000.2, Part 8, Paragraph 5a(5).

(4) Reviews and comments upon Services' Detailed LFT&E Plans and Reports.

(5) Monitors the Services' LFT&E program during its conduct.

(6) Conducts an independent assessment of individual Services' LFT&E programs (to include LFT&E programs conducted under the waiver provisions of Section 2366, Title 10, US Code) and prepares the Secretary of Defense independent LFT&E assessment report to Congress.

b. **DoD Component:**

(1) Recommends candidate systems for LFT&E.

(2) Develops and implements the LFT&E strategy for each affected system and ensures this strategy is fully described in the TEMP.

(3) Plans, programs, and budgets research, development, test and evaluation and other procurement funds in support of LFT&E including the acquisition of threat targets/munitions or acceptable surrogates.

(4) Identifies critical LFT&E issues, prepares and approves required plans, reports and other documentation.

(5) Permits on-site monitoring of all LFT&E tests by OSD D,T&E.

(6) Conducts engineering assessments of possible design changes resulting from LFT&E and develops programs for incorporating cost effective design changes as early as possible commensurate with the system acquisition strategy.

(7) Prepares request for waiver from Full-up, System-Level, Live Fire Testing if such testing is unreasonably expensive and impractical. Prepares alternative plans for evaluating the vulnerability or lethality of the system for inclusion with the request for waiver.

(8) Manages Service facilities, resources and provides guidance on operating these test facilities to support LFT&E.

7. LFT&E DOCUMENTS: Conduct of LFT&E will require the preparation and submission to OSD of the following documents.

a. **Test and Evaluation Master Plan** (See DoD 5000.2M for format requirements): The TEMP is the basic planning document for all life cycle T&E related to a particular system acquisition and is used by the Acquisition Executives, PEO's, and all other decision bodies in planning, reviewing, and approving T&E. As such, the TEMP will also serve as the basic planning document for the review and approval of the LFT&E strategy, and therefore should be current. Updates to the TEMP should reflect any changes to vulnerability/lethality requirements. Section II of the TEMP shall include a discussion of LFT&E that charts the LFT&E course of action during the materiel acquisition process. All LFT&E that has an impact on program decisions will be outlined in this section of the TEMP. The TEMP summarizes where, when, and how the LFT&E issues will be tested/evaluated. It shows the relationship of the LFT&E issues to the critical technical parameters and operational requirements, the planned LFT; the amount and type of LFT that will be performed to support each program decision point; and indicates where schedule, resource, or budget constraints may have an impact on the adequacy of planned LFT&E. The TEMP is a dynamic document and is prepared by the DoD Component according to guidance contained in Chapter 7, DoD Manual 5000.2-M, "Test and Evaluation Master Plan." Specific LFT&E items considered for inclusion in the TEMP are: a description of the overall Live Fire Test and Evaluation strategy for the item; critical Live Fire Test and Evaluation issues; required levels of system vulnerability/lethality; the management of the Live Fire Test and Evaluation program; Live Fire Test and Evaluation schedule, funding plans and requirements; related prior and future Live Fire Test and Evaluation efforts; the evaluation plan and shot selection process; and major test limitations for the conduct of Live Fire Test and Evaluation. Live Fire Test and Evaluation resource requirements (including test articles and instrumentation) will be appropriately identified early in the development cycle and appear in the Test and Evaluation Resource Summary.

b. **Detailed Test and Evaluation Plan**: This document describes the detailed test procedures, test conditions, data collection and analysis processes to be used during the conduct of each Live Fire Test. Appendix B. provides additional detail on the content of this document. The Detailed Test and Evaluation Plan will be submitted to OSD for comment at least 30 days before test initiation. OSD shall have 15 days for submission of comments subsequent to its receipt of the Detailed Test Plan/ Evaluation Plan.

c. **Detailed Test and Evaluation Report**: The results and overall evaluation of each Live Fire Test, identified in the LFT&E strategy, will be documented by the Service and submitted to OSD 120 days after test completion. The format of the Report(s) is a Service option. However, to facilitate the OSD independent report to Congress, each Service report should include the firing results, test conditions, a description of any deviations approved subsequent to the preparation of the Detailed Test and Evaluation Plan, test limitations, conclusions, and the evaluation of live fire

vulnerability/lethality based on available information (if applicable). OSD shall have 45 days, from receipt of the final Service Detailed Test and Evaluation Report for preparation and transmittal of the independent assessment report to Congress. Service technical review will normally be requested prior to transmittal.

Additional documentation may be prepared as part of the developmental process to support engineering tests that bear on the Live Fire Test Assessment. Review and approval of this documentation will be at the Service level.

8. WAIVERS: See DoD Manual 5000.2-M, Part 11, "Live Fire Test and Evaluation Waiver." Waivers from Full-up, System-Level, Live Fire Testing, for covered systems/major munitions programs, including product improvements that significantly affect vulnerability or lethality, cannot be granted after Milestone II, except through legislative relief. Included with the request for waiver will be a report explaining how the Service plans to evaluate the vulnerability or lethality of the system or program, and assessing possible alternatives to Full-up System-level Live Fire Testing. With the exception of the requirements for Full-up, System-Level, Live Fire Testing, the requirements for waived LFT&E programs are no less stringent than for non-waived programs, to include the inclusion of an LFT&E strategy in the TEMP and an OSD independent assessment report to Congress. Waiver requests will be submitted by the Service Secretaries to the DepSecDef.

APPENDIX A
REFERENCES

1. Section 2366, Title 10, United States Code, Legislation Pertaining to Live Fire Test and Evaluation (See below).

2. Department of Defense Directive 5000.1, Defense Acquisition.

3. Department of Defense Instruction 5000.2, Defense Acquisition Management Policies and Procedures.

4. Department of Defense Manual 5000.2M.

FY86 DoD Authorization Act

SEC 123. CONDITIONS ON PROCUREMENT OF CERTAIN COMBAT VEHICLES

(a) Testing Requirements – (1) Chapter 139 of title 10, United States Code, is amended by adding at the end thereof the following new section:

"§2362. Testing requirements: wheeled or tracked armored vehicles

"(a) The Secretary of Defense shall provide that a contract for procurement by the Department of Defense under a major vehicle program may not be entered into unless the testing carried out during the development of the vehicle meets the requirements of subsection (b).

"(b) The testing of a vehicle referred to in subsection (a) shall include testing of the vulnerability of such vehicle to the most capable weapon that is likely to be a combat threat to the vehicle and against which the vehicle is designed to survive. Such tests –

"(1) shall be carried out in a manner modeled after the Joint Live-Fire Test Program for the Bradley Fighting Vehicle; and

"(2) if the test vehicle is to replace an existing vehicle, shall at least include test shots fired under the same conditions at both the test vehicle and the vehicle it is to replace, with each vehicle being equipped with all of the elements with which the vehicle would be equipped in combat.

"(c) (1) The Secretary of Defense shall submit to the defense committees a report with respect to the testing of each vehicle for which testing is required under this section.

"(2) A Report under paragraph (1) --

"(A) shall be submitted in both a classified and unclassified form;

"(B) shall be submitted with the first request to Congress for appropriations for procurement --

"(i) of the vehicle; or

"(ii) of modifications to an existing vehicle.

"(3) Each such report shall include --

"(A) a complete description of the firing parameters used in the testing and an analysis of the effect on the vehicle of each test shot made;

"(B) a description and justification of the merit and pass/fail criterion used in carrying out the test;

"(C) a description of the potential shortcomings of the vehicle that were revealed by the testing and (if any were revealed) the plan of the Secretary to incorporate into the design of the vehicle changes that are considered cost effective and that are necessary to overcome such shortcomings; and

"(D) if the test vehicle is to replace an existing vehicle, a comparison --

"(i) of the estimated unit cost of each newly developed vehicle (or of the newly developed survivability modifications being made to an existing vehicle); with

"(ii) the unit cost of the vehicle that is to be replaced by the test vehicle.

"(d) The Secretary of Defense shall include in the Department of Defense plan referred to as the Test and Evaluation Master Plan that is established for any major vehicle program an estimated cost and schedule of the testing to be carried out with respect to the program.

"(e) In this section:

"(1) 'Major vehicle program' means a major defense acquisition program for the acquisition of --

"(A) a newly developed combat wheeled or tracked armored vehicle; or

"(B) a combat wheeled or tracked armored vehicle with significant newly developed survivability modifications.

"(2) 'Major defense acquisition program' means a program subject to the Selected Acquisition Report requirements of section 139a of this title.

"(3) 'Defense committees' means the Committees on Armed Services and on Appropriations of the Senate and House of Representatives."

(2) The table of sections at the beginning of such chapter is amended by adding at the end thereof the following new item:

"2362. Testing requirements: wheeled or tracked armored vehicles"

(b) Effective Date – The amendments made by subsection (a) shall take effect on January 1, 1987

FY86 DoD Authorization Act Conference Report

Condition on procurement of certain combat vehicles (sec. 123)

The House amendment contained a provision (sec. 117) that would prohibit the Department of Defense from procuring any new combat wheeled or armored vehicles until these vehicles have undergone live-fire survivability testing.

The Senate bill contained no similar provision.

The Senate recedes with an amendment that applies this prohibition only to major defense acquisition programs, consistent with section 139 of title 10, United States Code. The conferees agree that this provision is not intended to criticize the Army's current testing procedures or programs.

FY87 DoD Authorization Act

SEC 910. TESTING OF CERTAIN WEAPON SYSTEMS AND MUNITIONS

(a) Survivability and Lethality Testing and Operational Testing. -- (1) Chapter 139 of title 1 0, United States Code, is amended by adding after section 2365 (as added by section 909) the following new section:

§2366. Majors systems and munitions programs: survivability and lethality testing; operational testing

"(a) Requirements -- The Secretary of Defense shall provide that

"(1) a covered system may not proceed beyond low-rate initial production until realistic survivability testing of the system is completed in accordance with this section;

"(2) a major munition program or a missile program may not proceed beyond low-rate initial production until realistic lethality testing of the program is completed in accordance with this section; and

"(3) a major defense acquisition program may not proceed beyond low-rate initial production until initial operational test and evaluation of the program is completed in accordance with this section.

"(b) Test Guidelines -- (1) Survivability and lethality tests required under subsection (a) shall be carried out sufficiently early in the development phase of the system or program to allow any design deficiency demonstrated by the testing to be corrected in the design of the system, munition, or missile before proceeding beyond low-rate initial production.

"(2) In the case of a major defense acquisition program, no person employed by the contractor for the system being tested may be involved in the conduct of the operational test and evaluation required under subsection (a)

"(3) The costs of all tests required under that subsection shall be paid from funds available for the system being tested.

"(c) Waiver Authority -- The Secretary of Defense may waive the application of the survivability and lethality tests of this section to a covered system, munitions program, or missile program if the Secretary, before the system or program enters full-scale engineering development, certifies to Congress that live-fire testing of such system or program would be unreasonably expensive and impractical

"(d) Waiver in Time of War or Mobilization - In time of war or mobilization, the President may suspend the operation of any provision of this section.

"(e) Definitions - In this section:

"(1) The term 'covered system' means a vehicle, weapon platform, or conventional weapon system --

"(A) that includes features designed to provide some degree of protection to users in combat; and

"(B) that is a major system within the meaning of that term in section 2303(5) of this title

"(2) The term 'major munitions program' means --

(A) a munition program for which more than 1,000,000 rounds are planned to be acquired, or

"(B) a conventional munitions program that is a major system within the meaning of that term in section 2302(5) of this title "

"(3) The term 'major defense acquisition program' means

"(A) a conventional weapons system that is a major system within the meaning of that term in section 2302(5) of this title; and

"(B) is designed for use in combat.

"(4) The term 'realistic survivability testing' means, in the case of a covered system, testing for vulnerability and survivability of the system in combat by firing munitions likely to be encountered in combat (or munitions with a capability similar to such munitions) at the system configured for combat, with the primary emphasis on testing vulnerability with respect to potential user casualties and taking into equal consideration the operational requirements and combat performance of the system.

"(5) The term 'realistic lethality testing' means, in the case of a major munitions program or a missile program, testing for lethality by firing the munition or missile concerned at appropriate targets configured for combat

"(6) The term 'configured for combat', with respect to a weapon system, platform, or vehicle, means loaded or equipped with all dangerous materials (including all flammables and explosives) that would normally be on board in combat

"(7) The term 'operational test and evaluation' has the meaning given that term in section 138(a)(2)(A) of this title."

(2) The table of sections at the beginning of such chapter is amended by adding after the item relating to section 2365 (as added by section 909) the following new item:

"2366. Major systems and munitions programs: survivability and lethality testing; operational testing."

(b) Effective Date -- Section 2366 of title 10, United States Code (as added by subsection (a)), shall apply with respect to any decision to proceed with a program beyond low-rate initial production that is made --

(1) after May 31, 1987, in the case of a decision referred to in subsection (a)(1) or (a)(2) of such section; or

(2) after the date of the enactment of this Act, in the case of a decision referred to in subsection (a)(3) of such section.

(c) Time for Submission of annual Report of Director (OT&E) -- Subsection (g)(1) of section 138 of such title (as redesignated by section 101(a) of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (Public Law 99-433)) is amended by striking out "January 15" in the second sentence and all that follows through 'is prepared' and inserting in lieu thereof "10 days after the transmission of the budget for the next fiscal year under section 1105 of title 31."

FY87 DoD Authorization Act Conference Report

Survivability, lethality and operational testing (sec. 910)

Section 214 of the House amendment contained a provision that would require all new major conventional systems and weapons to be subjected to realistic, live-fire testing before entering production. A system would be tested for *vulnerability* and survivability by firing all the conventional threat munitions likely to be encountered in combat at the system configured for combat. A weapon would be tested for lethality by firing it at foreign targets configured for combat. The amendment would also require that independent operational testing be conducted for all new major conventional systems before entering production and that such test would include a side-by-side test of the system being acquired with equal-cost quantities of the system intended to be replaced or the nearest competitor of the system being acquired.

The Senate bill contained no similar provision.

The conferees agreed to a modified version of the House provision contained in section 214. The provision would require that a major conventional weapons system not proceed beyond low-rate initial production until (1) a realistic survivability or lethality test is completed; and (2) an initial operational test and evaluation is completed. Such survivability and lethality tests would be carried out early enough to allow design deficiencies to be corrected before production. Employees of the contractor for the system being tested would not be involved in the conduct of the initial operational test and evaluation.

The conferees direct that the Secretary of Defense conduct, as a matter of high priority, a comprehensive review of testing policy in the Department. The conferees believe that the Secretary's review should include the following issues:

(1) A review of the length of time currently required in the acquisition process and ways to reduce the time devoted to testing;

(2) A review of existing testing policies of the Department and the Military Departments, and a determination of inconsistencies in fundamental testing philosophies and approaches;

(3) A review of the relationship between development testing and initial operational testing, and what role each plays in the acquisition process.

The last issue merits special attention by the Secretary. The conferees believe that developmental testing and initial operational testing are separate, yet complementary, elements in the acquisition process. Developmental testing is designed to support the development of improved weapon systems. Initial operational testing is designed to prevent the production of flawed systems. Initial operational testing can never assume the functions of developmental testing, because the legislative history that established the Office of Operational Test and Evaluation inherently created an independent inspector general-type of function. Similarly, development testing (by definition) implies close collaboration with the developers of new systems, which prohibits such testing from performing the role the Congress intended for initial operational testing.

This situation suggests that fundamental review by the Secretary is in order. The conferees invite the Secretary to comment on section 910, as well as section 123 in Public Law 99-145 and other testing statutes. The Committees on Armed Services in both the U.S. Senate and the House of Representatives intend to conduct comprehensive hearings on testing policies and procedures next year and are prepared to amend section 910 and other statutory testing provisions after thorough consideration of the Secretary's review. The Secretary is invited to offer draft legislation if his review suggests such a course is warranted.

The Secretary shall transmit his report to the Committees on Armed Services of the Senate and the House of Representatives by March 15, 1987 to facilitate early hearings.

FY88-89 DoD Authorization Act

SEC 802. SURVIVABILITY AND LETHALITY TESTING OF MAJOR SYSTEMS

(a) Inclusion of Significant Product Improvement Programs -- (1) Subsection (a) of section 2366 of title 10, United States Code, is amended --

(A) by inserting "(1)" after "Requirements. --";

(B) by redesignating paragraphs (1), (2), and (3) as subparagraphs (A), (B), and (C), respectively, and

(C) by adding at the end the following.

"(2) The Secretary of Defense shall provide that a covered product improvement program may not proceed beyond low-rate initial production until --

"(A) in the case of a product improvement to a covered system, realistic survivability testing is completed in accordance with this section; and

"(B) in the case of a product improvement to a major munitions program or a missile program, realistic lethality testing is completed in accordance with this section

(2) Subsection (b)(1) of such section is amended --

(1) by inserting "(including a covered product improvement program)" after "system or program"; and

(2) by inserting "(or in the product modification or upgrade to the system, munition, or missile)" after "or missile."

(3) Subsection (c) of such section is amended by striking out "or missile program" and inserting in lieu thereof "missile program, or covered product improvement program."

(4) Subsection (e) of such section is amended --

(A) by inserting "(or a covered product improvement program for a covered system)" in paragraph (4) after "in the case of a covered system";

(B) by inserting "(or a covered product improvement program for such a program)" in paragraph (5) after "missile program"; and

(C) by adding at the end the following new paragraph:

"(8) The term 'covered product improvement program' means a program under which --

"(A) a modification or upgrade will be made to a covered system which (as determined by the Secretary of Defense) is likely to affect significantly the survivability of such system; or

"(B) a modification or upgrade will be made to a major munitions program or a missile program which (as determined by the Secretary of Defense) is likely to affect significantly the lethality of the munition or missile produced under the program."

(b) Use of Contractor Personnel in Operational Test and Evaluation -- Subsection (b)(2) of such section is amended by adding at the end the following new sentence: "The limitation in the preceding sentence does not apply to the extent that the Secretary of Defense plans for persons employed by that contractor to be involved in the operation, maintenance, and support of the system being tested when the system is deployed in combat."

(c) Explanation for Waivers by Secretary of Defense - Subsection (c) of such section is amended by adding at the end the following new sentence: "The Secretary shall include with any such certification a report explaining how the Secretary plans to evaluate the survivability or the lethality of the system or program and assessing possible alternatives to realistic survivability testing of the system or program."

(d) Reporting to Congress -- Such section is further amended --

(1) by inserting "(1)" in subsection (c) before "The Secretary",

(2) by striking out "(d)" and all that follows through "In time of war" and inserting in lieu thereof "(2) In time of war"; and

(3) by inserting before subsection (e) the following new subsection (d):

(d) Reporting to Congress -- At the conclusion of survivability or lethality testing under subsection (a), the Secretary of Defense shall submit a report on the testing to the defense committees of Congress (as defined in section 2362(e)(3) of this title)."

(e) Definition of Realistic Survivability Testing -- Subsection (e)(4) of such section is amended --

(1) by striking out "and survivability", and

(2) by striking out "operational requirements" and inserting in lieu thereof "susceptibility to attack."

FY88-89 DoD Authorization Act Conference Report

Live-Fire Testing (Sec. 802)

The House bill contained a provision (section 822) that would amend section 2366 of title 10, United States Code governing live-fire testing by the Department of Defense. The provision would require that covered programs not proceed beyond low rate initial production until vulnerability testing is completed, require the Secretary of Defense to designate a civilian official in the Department *of Defense responsible* for vulnerability and lethality testing, and other actions. The Senate amendment contained a provision (sec. 806) that would repeal section 2366.

The Senate recedes with an amendment that would require covered product improvement programs not proceed beyond low rate initial production until survivability and lethality testing is completed, provide for reports to Congress on such tests, clarify the definition of realistic survivability testing, and clarify contractor involvement during operational testing.

The conferees believe that live-fire testing is a valuable tool for determining the inherent strengths and weaknesses of adversary, U.S. and allied weapon systems. The conferees intend that the Secretary of Defense implement this section in a manner which encourages the conduct of full-up vulnerability and lethality tests under realistic combat conditions, first at the sub-scale level as sub-scale systems are developed, and later at the full-scale level mandated in the legislation.

The conferees intend this type of developmental testing to be performed as part of the responsibilities of the Under Secretary of Defense for Acquisition. Before such testing begins, the office of the Under Secretary should have reviewed the adequacy of the test plans, or alternatives to full-scale testing, prepared by the services concerned. While testing is underway, the Under Secretary should have full access to all test data and reports and should ensure adequate resources are provided for the conduct of realistic tests, including threat munitions and targets, for instruments facilities, and for adequate staff and funding for the Office of Live-Fire Testing. The conferees realize the Department of Defense, at times, conducts operational tests and developmental tests simultaneously. It is not the intent of the conferees to exclude contractor involvement in the development portion of these tests.

APPENDIX B
DETAILED LIVE FIRE TEST AND EVALUATION PLAN

The following paragraphs outline the required content of the Detailed Test and/or Evaluation Plan for Live Fire Testing. No standard format will be prescribed in order to allow the Services flexibility to tailor their plans to their individual requirements. However, the Detailed Test and/or Evaluation Plan must, as a minimum, contain the material described below.

1. A cover page providing the name of the system, the activity/agency responsible for preparation of the plan, the date, plan classification, and applicable distribution statement.

2. A coordination sheet containing signatures of Service approval authorities.

3. A page providing administrative information on the position, name, organization, telephone number, and electronic mail addresses of key LFT&E personnel

4. A section describing the types of threats or targets that the system is expected to encounter during the operational life of the system and the key characteristics of these threats/targets which affect system vulnerability/lethality. A reference to the specific threat definition document/authority. A discussion of the rationale/criteria used to select the specific threats/targets and the basis used to determine the number of threats/targets to be tested in the Live Fire Testing.

5. If actual threats/targets are not available, then the plan must describe the threat/target surrogate to be used in lieu of the actual threat/target and the rationale for its selection.

6. A statement of the test objectives in sufficient detail to demonstrate that the evaluation procedures are appropriate and adequate.

7. A description of the specific threats and targets to be tested including a detailed configuration and stowage plan (to include payload configuration) for each target. Describe the rationale/scenarios on which the target configuration/stowage was based.

8. A listing of any differences between the tested system and the system that will be fielded. As specifically as possible, identify the degree to which test results from the tested configuration are expected to be representative of the vulnerability or lethality of the Production systems.

9. An identification of any test limitations particularly any potential lack of realism from absence of components from use of surrogates, from the inerting of fuzes on stowed ammunition, etc. Identify the impact of these limitations on test results.

10. A description of the shot selection process. Describe the process used to establish the test conditions for randomly selected shots, including any rules ("exclusion rules") used to determine whether a randomly generated shot may be excluded from testing. For engineering shots (i.e., shots selected to examine specific vulnerability/ lethality issues), describe the issue and the associated rationale for selecting the specific conditions for these shots. List the specific impact conditions and impact points for each shot, and whether it is a random or engineering shot.

11. A detailed description of the test approach, test setup, test conditions, firing procedures, damage assessment and repair process, test sequence, instrumentation, data collection and analysis procedures, and responsibilities for collecting and documenting test results. Include any standard forms that will be used to document test results.

12. A prediction of the anticipated results of each shot. These predictions may be based on computer models, engineering principles, or engineering judgments. Detail should be consistent with the technique used for casualty/damage prediction.

13. A detailed description of the analysis/evaluation plan for the Live Fire Test. The analysis/evaluation plan must be consistent with the test design and the data to be collected. Indicate any statistical test designs used for direct comparisons or for assessing any pass/fail criterion.

14. A general description, including applicable references, of any vulnerability/ lethality models to be used to support shotline selection, preshot predictions, and/or the analysis/evaluation. This material should include a discussion of model algorithm/model input limitations as well as references to the sources of key model inputs.

OFFICE OF THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301-3000

#548
93-F-2156

ACQUISITION

06 AUG 1993

MEMORANDUM FOR DEPUTY UNDER SECRETARY OF THE ARMY (OPERATIONS RESEARCH)
DIRECTOR, TEST & EVALUATION AND TECHNOLOGY REQUIREMENTS (N-091)
DIRECTOR, AIR FORCE TEST & EVALUATION
DEPUTY DIRECTOR, LAND AND MARITIME PROGRAMS
DEPUTY DIRECTOR, AIR AND SPACE PROGRAMS

SUBJECT: Draft Live Fire Test & Evaluation (LFT&E)Guidelines

The Committee Chairman has reported that they have reached a point of diminishing returns on their drafting of the Guidelines. As yet, the Draft Guidelines do not contain the appendix which deals with the waiver process pending completion of the Army effort. However, I request your personal review of the bulk of the Guidelines (Attachment 1). Also attached are: a list of differences with 5000 series (Attachment 2), and significant comments about the Guidelines (Attachment 3). Your staff should have a compilation of the raw comments.

I intend to send the final Guidelines to USD(A) for signature after we have completed this effort. Certainly, this will be necessary in the event that the Guidelines conflict with the 5000 series. The draft Guidelines do contain such conflicts as identified in the attachment.

Please forward your comments to me by mid-August.

Pete

Charles E. Adolph
Director
Test & Evaluation

Attachments
(1) Draft LFT&E Guidelines
(2) Differences of Draft Guidelines with 5000 Series
(3) Significant comments about Guidelines by Committee

cc:
Committee Chairman, Guidelines Committee

ATT 1

ATTACHMENT 1

LIVE FIRE TEST AND EVALUATION (LFT&E) GUIDELINES

1. PURPOSE: The purpose of these guidelines is to describe a disciplined management approach for the conduct of Live Fire Test and Evaluation (LFT&E) within the Department of Defense (DoD). It describes the objectives and strategy of LFT&E, provides guidance for LFT&E planning, testing, evaluation and documentation, and discusses the responsibilities of LFT&E principals. Applicable documents are DoD Directive 5000.1, DoD Instruction 5000.2, and DoD Manual 5000.2-M.

2. OBJECTIVES: The objective of LFT&E is to provide a timely and reasonable assessment of the vulnerability/lethality of a system as it progresses through its development and prior to full-rate production. In particular:

- to allow any design deficiency identified by the testing and evaluation to be corrected in design before proceeding beyond low-rate initial production.
- to ensure that knowledge of user casualties and system vulnerabilities or lethality is based on testing of the system under realistic combat conditions.
- to provide information to decision makers on potential user casualties, vulnerabilities, and lethality.

3. SCOPE: These guidelines apply to the Office of the Secretary of Defense (OSD), the Organization of the Joint Chiefs of Staff, the Unified and Specified Commands, the Military Departments, and all DoD components who have responsibilities associated with the design, development, procurement, or modification of combat materiel items. Heads of DoD components may issue implementing guidance to provide for unique requirements within their respective components.

4. THE LAW: Chapter 139 of Title 10, United States Code, was amended by adding requirements for vulnerability and lethality Live Fire Testing (LFT). Appendix A provides copies of relevant sections of these laws.

5. DEFINITIONS: The legislation covering LFT (Appendix A) also provides definitions of "*covered system(s)*" including "*covered product improvement programs*," "*realistic survivability testing*," "*realistic lethality testing*," and "*configured for combat*." The following definitions are not given in that legislation but are provided here to permit a better understanding of LFT requirements:

a. *Full-up Test*: A test conducted on a complete or partial system loaded and/or equipped with all dangerous materials (including flammables and explosives) that would normally be on board in combat. All critical subsystems, which could contribute to the test outcome, must be operating (e.g., hydraulic and electrical power) under realistic conditions. For lethality testing, the munitions or missile must be production representative. The target must be representative of the threat, and be sufficiently realistic to demonstrate the lethal effects the weapon is designed to produce.

b. *System-Level Test*: A test conducted on the complete or total system. A system-level test is full-scale, but may or may not be configured for combat.

c. *Full-up, System-Level Test*: A Live Fire Test conducted on the total system with all dangerous materials on board.

d. *Live-Fire Test:* A test event within the OSD approved LFT&E strategy which involves the firing of actual munitions at target components, target sub-systems, target sub-assemblies or full-scale targets configured for combat to examine personnel casualty, vulnerability and/or lethality issues.

d. *Survivability*: The capability of a system to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

e. *Vulnerability*: The characteristic of a system which cause it to suffer a definite degradation (loss or reduction of capability to perform its designated mission) as a result of having been subjected to a certain level of effects in a man-made hostile environment. Vulnerability is considered a subset of survivability.

f. *Lethality*: The ability of a munition (or laser, high power microwave, etc.) to cause damage that will cause the loss or a degradation in the ability of a target system to complete its designated mission(s).

g. *Susceptibility*: The degree to which a weapon system is open to effective attack due to one or more inherent weakness (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.) Susceptibility is considered a subset of survivability.

h. *Major System*: As specified in Title 10, United States Code, Section 2302(5).

6. IMPLEMENTATION: An active, well-planned, well-managed and well-executed LFT&E strategy is essential to understanding system vulnerability/lethality and will be an essential element of the information supporting decisions regarding the acquisition of materiel as well as the development of doctrine for its proper tactical employment. The LFT&E Strategy for a given item should be structured and scheduled so that any design changes, resulting from that testing and analysis, may be incorporated before proceeding beyond low-rate initial production. Furthermore, the LFT&E strategy should be managed, including planning and programming, in such a manner that all elements of the test and evaluation (T&E) process are well-integrated and complementary. The availability of facilities, test sites, instrumentation, personnel, threat targets, munitions, and/or directed energy weapons should be managed throughout all phases of the budget cycle.

a. LFT&E should be initiated as early as possible before full-rate production (Milestone III), to identify and assess possible design deficiencies so that appropriate corrective actions can be taken. Beginning with component level testing and analysis during concept demonstration and validation, live-fire vulnerability/lethality test and evaluation continues through engineering and manufacturing (E&MD) development with additional components/subsystem testing, and progresses to LFT&E of production representative items before the system proceeds beyond low-rate initial production. The LFT&E strategy should be structured to provide a timely and reasonable examination an understanding of the vulnerability/lethality of US weapon systems and munitions/directed energy weapons to the full spectrum of validated combat threats/targets. Subsequent product improvements to covered systems meeting the criteria given in Appendix A are also required to undergo Live Fire Testing. All LFT&E will be conducted by the Services with OSD oversight. Non-Developmental Items (NDI) that meet the definition of covered system or munition may also be required to undergo LFT&E.

b. Live Fire Testing of all systems will be predicated upon the intelligence community sanctioned threat provided in the System Threat Assessment Report (STAR).

c. Vulnerability and lethality assessments may require the use of validated modeling/simulation and other techniques. Modeling/simulation and other analytical efforts can be essential elements in a LFT&E strategy.

d. The generation of data to resolve critical LFT&E issues in an efficient and cost effective manner and the elimination of potential or perceived bias shall be of paramount concern in the shot-line selection process for live-fire testing. While an element of randomness in shot-line selection is often desirable to eliminate the perception of bias, total reliance on complete randomness may neither be consistent with the test objectives nor be an efficient use of test resources. Random shotlines are generated from a realistic distribution of hit points, to include such factors as the weapon system operator, target signatures and weapon seeker characteristics. In most cases a mixture of random shotlines (shotlines generated from likely hit points) and engineering shotlines (i.e., shotlines specifically selected by the evaluator to address specific vulnerability/lethality issues) will be appropriate. To the

extent possible, some degree of randomness should be included in the selection of engineering shotlines. Random shotlines will be selected using realistic combat distributions, when available.

e. The Services shall prepare Reports to Congress for LFT&E of A-CAT III and IV programs. These reports shall be sent through USD(A) to Congress.

f. Although LFT&E programs may differ significantly in scope and timing, the level of maturity at various stages of the acquisition process is basically the following: By Milestone I, a decision should be made as to whether the system meets the legislative criteria for a covered system. Initial draft strategies should identify proposed issues, existing data in support of the issues, and Live Fire Tests to be conducted throughout the acquisition process. By Milestone II, the TEMP should contain a mature strategy. In particular, the strategy must either commit to full-up Live Fire Testing, or a waiver request and alternative LFT&E plan must have been submitted for approval in accordance with DoD Manual 5000.2-M, Part 11, "Live Fire Test and Evaluation Waiver." The entire LFT&E program, to include testing, evaluation, and reporting, must be completed by Milestone III.

7. RESPONSIBILITIES: The responsibilities of the DoD Staff and the Services relative to LFT&E are outlined below:

a. OSD:

(1) The Director, Test and Evaluation (D,T&E):

(a) Serves as the OSD focal point for review, coordination, and approval of LFT&E policy.

(b) Approves LFT&E strategies, as provided in the Test and Evaluation Master Plan (TEMP), IAW DoDI 5000.2 and DoD Manual 5000.2-M. Approves LFT&E strategies submitted outside the TEMP process.

(c) Approves candidate systems for LFT&E. Annually reviews all potential systems for inclusion or exclusion from the LFT&E oversight list in accordance with DoDI 5000.2, Part 8, Paragraph 5a(5).

(2) The Deputy Directors, Test and Evaluation, for Air and Space Programs and Land and Maritime Programs (DDT&E/A&SP/L&MP):

(a) Develop, and recommend DoD LFT&E policy.

(b) Review and recommend approval of Service LFT&E strategies as provided in the Test and Evaluation Master Plan, and review and recommend approval of LFT&E strategies submitted outside the TEMP process.

(c) Review and comment upon Services' Detailed LFT&E Plans and Reports.

(d) Monitor the Services LFT&E program during its conduct.

(e) Conduct an independent assessment of individual Services' A CAT I & II LFT&E programs (to include LFT&E programs conducted under the waiver provisions of Section 2366, Title 10, US Code) and prepare the Secretary of Defense independent LFT&E assessment report to Congress.

(f) Recommends approval of candidate systems for LFT&E proposed by DoD components and recommends candidate systems when deemed appropriate.

b. **DoD Component:**

(1) Recommends candidate systems for LFT&E.

(2) Develops and implements the LFT&E strategy for each affected system and ensures this strategy is fully described in the TEMP.

(3) Plans, programs, and budgets research, development, test and evaluation and other procurement funds in support of LFT&E including the acquisition of threat targets/munitions or acceptable surrogates.

(4) Identifies critical LFT&E issues, prepares and approves required plans, reports and other documentation.

(5) Permits on-site monitoring of all LFT&E tests by the respective OSD D,T&E Office (ASP or LMS) having LFT&E oversight responsibility.

(6) Conducts engineering assessments of possible design changes resulting from LFT&E and develops programs for incorporating cost effective design changes as early as possible commensurate with the system acquisition strategy.

(7) Prepares request for waiver from Full-up System-Level Testing if such testing is unreasonably expensive and impractical. Prepares alternative plans for evaluating the vulnerability or lethality of the system for inclusion with the request for waiver.

(8) Manages Service facilities, resources and provides guidance on operating these test facilities to support LFT&E.

(9) Designates an Office of Primary Responsibility (OPR) who is responsible for establishing, reviewing, and supervising Service LFT&E policy and procedures.

(10) Prepare LFT&E Reports for A-CAT III and IV programs.

8. LFT&E DOCUMENTS: Conduct of LFT&E will require the preparation and submission to OSD of the following documents.

a. **Test and Evaluation Master Plan** (See DoD 5000.2M for format requirements): The TEMP is the basic planning document for all life cycle T&E related to a particular system acquisition and is used by the Acquisition Executives, PEO's, and all other decision bodies in planning, reviewing, and approving T&E. As such, the TEMP will also serve as the basic planning document for the review and approval of the LFT&E strategy. Updates to the TEMP should reflect any changes to vulnerability/lethality requirements. Section II of the TEMP shall include a discussion on LFT&E that charts the LFT&E course of action during the materiel acquisition process. All LFT&E that impacts on program decisions will be outlined in this section of the TEMP. The TEMP summarizes where, when, and how the LFT&E issues will be tested/ evaluated. It shows the relationship of the LFT&E issues to the critical technical parameters and operational requirements, the planned LFT; the amount and type of LFT that will be performed to support each program decision point; and indicates where schedule, resource, or budget constraints may have an impact on the adequacy of planned LFT&E. The TEMP is a dynamic document and is prepared by the DoD Component according to guidance contained in Chapter 7, DoD Manual 5000.2-M, "Test and Evaluation Master Plan." Specific LFT&E items considered for inclusion in the TEMP are: a description of the overall live fire test and evaluation strategy for the item; critical live fire test and evaluation issues; required levels of system vulnerability/lethality; the management of the live fire test and evaluation program; live fire test and evaluation schedule, funding plans and requirements; related prior and future live fire test and evaluation efforts; the evaluation plan and shot selection process; and major test limitations for the conduct of live fire test and evaluation. Live fire test and evaluation resource requirements (including test articles and instrumentation) will be appropriately identified in the Test and Evaluation Resource Summary.

For some system, a TEMP may not be appropriate. For these, the LFT&E strategy is staffed as a separate document. For other systems, strategy approval needs to occur outside the TEMP process because a system is designated for LFT&E between major milestones or because significant changes to the strategy are needed between milestones. In such cases, the strategy should be submitted to the appropriate Deputy Director, Test and Evaluation, in time to permit review and recommendation for approval prior to implementation of the strategy.

b. **Detailed Test and Evaluation Plan**: This document describes the detailed test procedures, test conditions, data collection and analysis processes to be used during the conduct of each Live Fire Test. Appendix C. provides additional detail on the content of this document. The Detailed Test and Evaluation Plan will be submitted to OSD for comment at least 30 days before test initiation. OSD shall have 15 days for submission of comments subsequent to its receipt of the Detailed Test Plan/ Evaluation Plan.

c. **Detailed Test and Evaluation Report**: The results and overall evaluation of each Live Fire Test, identified in the LFT&E Strategy, will be documented by the Service and submitted to OSD 120 days after test completion. The format of the Report(s) is a Service option. However, to facilitate the OSD independent report to Congress, each Service report should include the firing result, test conditions, a description of any deviations approved subsequent to the preparation of the Detailed Test and Evaluation Plan, test limitations, conclusions, and the evaluation of live-fire vulnerability/lethality based on available

information (if applicable). OSD shall have 45 days, from receipt of the final Service Detailed Test and Evaluation Report for preparation and transmittal of the independent assessment report to Congress. Service technical review will normally be requested prior to transmittal.

Additional documentation will be prepared as part of the developmental process to support engineering tests that bear on the Live Fire Test Assessment. Review and approval of this documentation will be at the Service level.

9. **WAIVERS:** See DoD Manual 5000.2-M, Part 11, "Live Fire Test and Evaluation Waiver." An example of supporting documentation that supports the Service contention that testing a combat loaded system, as specified by the legislation, is impractical or unreasonably expensive is at Appendix C. This supporting documentation shall be based on the knowledge of the vulnerability/ lethality of the system. Waivers for covered systems, including product improvements that significantly affect vulnerability or lethality, cannot be granted after Milestone II. With the exception of the requirements for full-up Live Fire Testing, the requirements for waivered LFT&E programs are no less stringent than for non-waivered programs, to include the inclusion of an LFT&E strategy in the TEMP and an OSD independent assessment report to Congress.

APPENDIX A

Legislation: ¶ 2366 of Title 10, U.S.C.

APPENDIX B

Example of Documentation for support waiver

ATTACHMENT 2

DIFFERENCES BETWEEN 1993 LIVE FIRE TEST AND EVALUATION (LFT&E) GUIDELINES AND CURRENT 5000 SERIES DOCUMENTATION

1. **Paragraph 6.,e.:** "The Services shall prepare reports to Congress for LFT&E of A-CAT III and IV programs. These reports shall be sent through USD(A) to Congress." - DoD Manual 5000.2-M, Part 10, Live Fire Test and Evaluation Report, specifically addresses the procedures for preparation and submission of the LFT&E Independent Report for A-CAT I and II systems, but is silent with respect to A-CAT III and IV systems. The procedures outlined in the Guidelines will also have to be reflected in the DoD Manual.

2. **Paragraph 7.,a.,(1),(b):** "Approves LFT&E strategies, as provided in the Test and Evaluation Master Plan (TEMP), IAW DoDI 5000.2 and DoD Manual 5000.2-M. Approves LFT&E strategies submitted outside the TEMP process." - There are those instances wherein the only requirement for OSD T&E oversight of a system/program is for LFT&E, and a complete TEMP is not submitted--only the LFT&E strategy. These instances are not addressed in the applicable 5000 Series documentation.

3. **Paragraph 7.,a.,(2),(b):** "Review and recommend approval of Service LFT&E strategies as provided in the Test and Evaluation Master Plan, and review and recommend approval of LFT&E strategies submitted outside the TEMP process." --See Item 2., above.

4. **Paragraph 7.,b.,(10):** "Prepare LFT&E Reports for A-CAT III and IV programs." --See Item 1,. above.

5. **Paragraph 8.,a.:** "For some systems, a TEMP may not be appropriate. For these, the LFT&E strategy is staffed as a separate document. For other systems, strategy approval needs to occur outside the TEMP process because a system is designated for LFT&E between milestones or because significant changes to the strategy are needed between milestones. In such cases, the strategy should be submitted to the appropriate Deputy Director, Test and Evaluation, in time to permit review and recommendation for approval prior to implementation of the strategy." -- See Item 2., above.

6. **Paragraph 8.,b.:** "Detailed Test and Evaluation Plan: This document describes the detailed test procedures, test conditions, data collection and analysis processes to be used during the conduct of each Live Fire Test. Appendix B. provides additional detail on the content of this document. The Detailed Test and Evaluation Plan will be submitted to OSD for comment at least 30 days before test initiation. OSD shall have 15 days for submission of comments subsequent to its receipt of the Detailed Test Plan/Evaluation Plan." This requirement contravenes the DoD 5000 Series by adding requirements and must be corrected.

7. **Paragraph 8.,c.:** "Detailed Test and Evaluation Report: The results and overall evaluation of each Live Fire Test, identified in the LFT&E Strategy, will be documented by the Service and submitted to OSD 120 days after test completion." The format of the report(s) is a Service option. However, to facilitate the OSD independent report to Congress, each Service report should include the firing result, test conditions, a description of any deviations approved subsequent to the preparation of the Detailed Test and Evaluation Plan, test limitations, conclusions, and the evaluation of live-fire vulnerability/lethality based on available information (if applicable). OSD shall have 45 days, from receipt of the final Service Detailed Test and Evaluation Report for preparation and transmittal of the independent assessment report to Congress. Service technical review will normally be requested prior to transmittal." This requirement contravenes the DoD 5000 Series by adding requirements and must be corrected.

ATTACHMENT 3

SIGNIFICANT (AS JUDGED BY CHAIRMAN) OSD AND SERVICE COMMENTS TO THE 1993 LFT&E GUIDELINES THAT WERE NOT INCORPORATED AND REASONS FOR NON-INCORPORATION

1. **OSD, DD,T&E/A&SP:** All comments incorporated or resolved.

2. **OSD, DD,T&E/L&MP:**

a. Paragraph 5., Definitions. Requested a change in definition of Full-up Live Fire Test: "For vulnerability testing, the test article in a full-up Live Fire Test must be the complete system and be combat configured (as defined in Section 2366, Title 10, US Code. The threat and test conditions must be sufficiently realistic, within constraints of safety and the law (e.g., environmental restrictions) to address possible synergistic effects." Not incorporated - Committee agreed to use definitions previously developed as part of Guidelines revision process.

b. Paragraph 6., Implementation. Requested inclusion of the following: "The LFT&E issues, including associated threats, and an outline of the evaluation plan should be included as part of the LFT&E strategy, which is contained in the TEMP (when a TEMP is required)." Not incorporated - Exceeds the requirements as outlined in Part 7, Test and Evaluation Master Plan, to DoD Manual 5000.2-M.

c. Paragraph 6., Implementation. Requested inclusion of the following: "The overarching issue for LFT&E is the vulnerability or lethality of the system to the expected threat. User (personnel) casualties must be a separate issue for vulnerability LFT&E programs. System specific issues should also be identified. Candidate issues include, but are not restricted to, a comparison of the system's vulnerability or lethality to that of appropriate fielded systems, and a comparison of the system's performance to relevant requirements." Not incorporated - Exceeds the requirements as outlined in Part 7, Test and Evaluation Master Plan, to DoD Manual 5000.2-M.

d. Paragraph 6., Implementation. Requested inclusion of the following: "For LFT&E vulnerability programs, comparisons should be made between the systems being assessed and the system(s) it is replacing or similar recent systems, as well as with recent wartime damage incidents and peacetime accidents. This comparison should be based on test shots fired under comparable conditions at both the tested system and the system it is to replace." Not incorporated - Exceeds the requirements as outlined in Part 7, Test and Evaluation Master Plan, to DoD Manual 5000.2-M.

e. Paragraph 7., Responsibilities. Requested inclusion of the following to D,T&E responsibilities: "Recommends approval of requests for waivers from full-up Live Fire Testing." Not included per March 22, 1993 principals meeting, the DTESG members agreed waivers should go from the Service Secretaries to the DepSecDef with the caveat that the DepSecDef could then delegate the action down to the USD(A)to adjudicate a recommendation--all agreed.

f. Paragraph 7., Responsibilities. Requested inclusion of the following to DD,T&E responsibilities: "Review and recommend approval of requests for waivers from full-up Live Fire Testing." Not included - See e., above.

g. Paragraph 9., Waivers. Requested inclusion of the following: "If the system or program is designated for LFT&E after Milestone II, any waiver approval must be concurrent with the designation of the system or program for LFT&E." Not included per opinion of OSD General Counsel.

3. **US Army:** All comments incorporated or resolved.

4. **US Navy:**

a. Paragraph 6., Implementation. Requested inclusion of the following: "High Value Platforms: Certain high-value platforms are acknowledged to be excluded from the requirement to test in a full-up, combat ready condition. High value systems such as ships, submarines, and aircraft will be subjected to other means of testing which, when taken in the aggregate and data engineered to simulate the full-up system, will constitute the acceptable from of live-fire testing. Testing for these systems will be accomplished on subcomponents and components, with either nondestructive or destructive testing. Survivability testing of ships differs from that of other covered systems in two significant respects. First, because of the magnitude of the capital investment in a ship, full-up testing with live munitions is not conducted against the ship or major, fully-outfitted sections of the ship. Secondly, because of the expected 30 to 40 year life of a ship, survivability is not designed for specific threat weapons known at the time of a ship's design, but rather for generic weapons effects, to account for a broad spectrum of potential threats." Not included - contravenes Section 2366, Title 10, USC.

b. Paragraph 9., Waivers. Requested inclusion of the following: "Ships and submarines will not require a waiver, when these programs inplement the procedures specified in the Navy's standard process for LFT&E of ships, 'Live Fire Test and Evaluation (LFT&E) of US Navy Ships Process Description'." Not included - contravenes Section 2366, Title 10, USC.

5. **U.S. Air Force:** All known comments incorporated or resolved.